

REMARKS

The Election Requirement

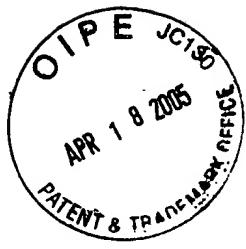
In Applicant's previous response to the election requirement, the Applicant had elected the species of Fig. 5 and listed all claims 1-44 as reading on the elected species. Each of the original independent claims had been intended to be generic to the species of both Figs. 4 and 5, because language referring to "a fluid inlet formed in the inner diameter" and "a fluid outlet formed in the outer diameter" was intended to read upon the inlet 170 and outlet 172, respectively, of the first stage of the multi-stage arrangement shown in Fig. 5. This reading was, and is, believed to be fully supported by the specification such as language found in paragraph 0024 at lines 8-11 thereof which reads "In the particular embodiment of Fig. 5, first stage 251 is similar to the embodiment of Fig. 4 described elsewhere, and includes air inlet 170, air outlet 172, and convolute flow channels 176."

Rather than belaboring that point, however, and in order to eliminate any possible ambiguity in the claims, Applicant has by the present amendment modified the language of each of the independent claims so that they refer to a "first stage fluid inlet" and a "first stage fluid outlet". Thus, the language of the claims as amended now clearly reads upon the elected embodiment of Fig. 5 and is in fact generic to both embodiments.

Turning now to the claims as amended, the Examiner's substantive rejection of certain claims has been based upon either of two references.

The first reference relied upon by the Examiner is U.S. Patent No. 3,831,374 to Nicita. The Nicita patent discloses two very different embodiments. The first

embodiment represented by Fig. 1 of Nicita, which is reproduced below with some additional markings to help understand the fluid flow path, has a cold cell construction wherein each cold cell includes first, second and third stages 48, 49 and 51, respectively. The cool air first enters at 12, then flows radially outward in path 15, then enters the first stage 48 at the radially outer edge thereof, flowing radially inward into space 53, which carries it to the radially inner inlet to second stage 49 then flows radially outward through second stage 49, then flows through space 50 to the radially outward inlet of third stage 51, then flows radially inward through third stage 51 into space 32 surrounding combustion area 17. This flow path is highlighted by the heavy black arrows which have been added to the reproduction of Fig. 1 below.



PATENTED AUG 27 1974

3,831,374

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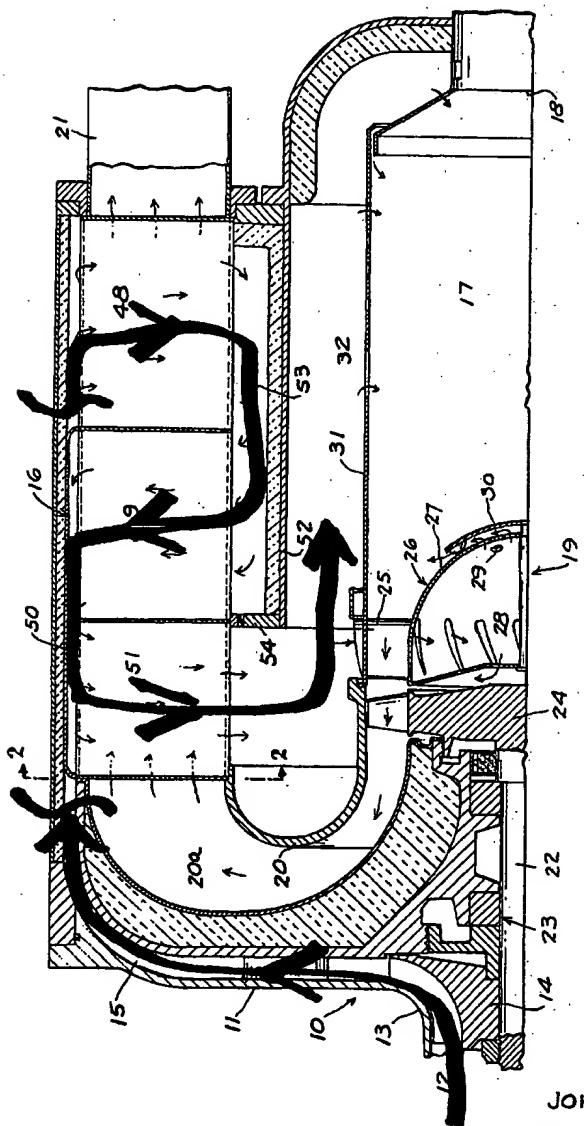


FIG. 1

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Thus in this first embodiment of Nicita, the fluid flow through each of the respective stages such as 48, 49 and 51 of each cold cell is purely radial in an either inward or outward direction, and in no case does a given stage have a stage inlet and stage outlet at diagonally opposite corners of the stage.

The second embodiment of Nicita is represented by Fig. 6 thereof which is reproduced below. In Nicita's Fig. 6 embodiment, each cold cell includes a single stage which has its stage inlet 49a at the outside diameter and which has its stage outlet 50a at the inside diameter. Thus although the embodiment of Fig. 6 of Nicita does have stage inlets and outlets at diagonally opposite corners, those positions are reversed as compared to the requirements of the claims of the present application which require that there be at least a first stage which has its inlet on the inside diameter and its outlet on the outside diameter.

The arrangement of Nicita's second embodiment is shown in the following marked up version of Fig. 6 thereof, where again heavy black arrows have been added to emphasize the flow path through the cold cell.



PATENTED AUG 27 1974

3,831,374

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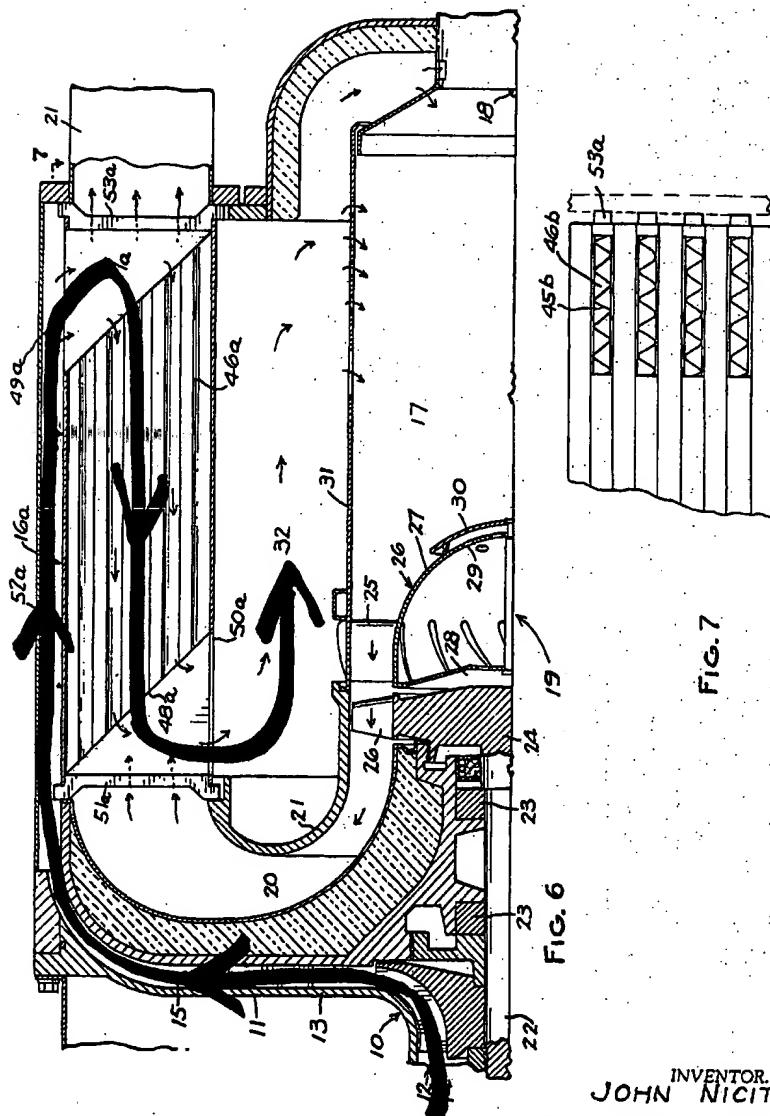


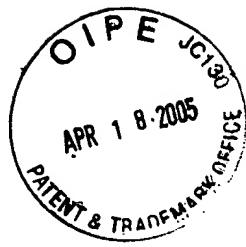
FIG. 7

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The Ryan reference U.S. Patent No. 6,438,936 shows a very conventional flow pattern through its cold cells in what is typically referred to as a U-shape or C-shape pattern. Fig. 1 of Ryan which is reproduced below shows that for its cold cell both the cold cell inlet 42 and cold cell outlet 44 are located on the inside diameter of the cell, and the cold air flow through this cold cell goes through a variety of paths of differing lengths depending upon whether the path is one of the radially inwardmost paths or one of the radially outwardmost paths as have been highlighted and identified on the reproduction of Ryan Fig. 1 set forth below:



U.S. Patent

Aug. 27, 2002

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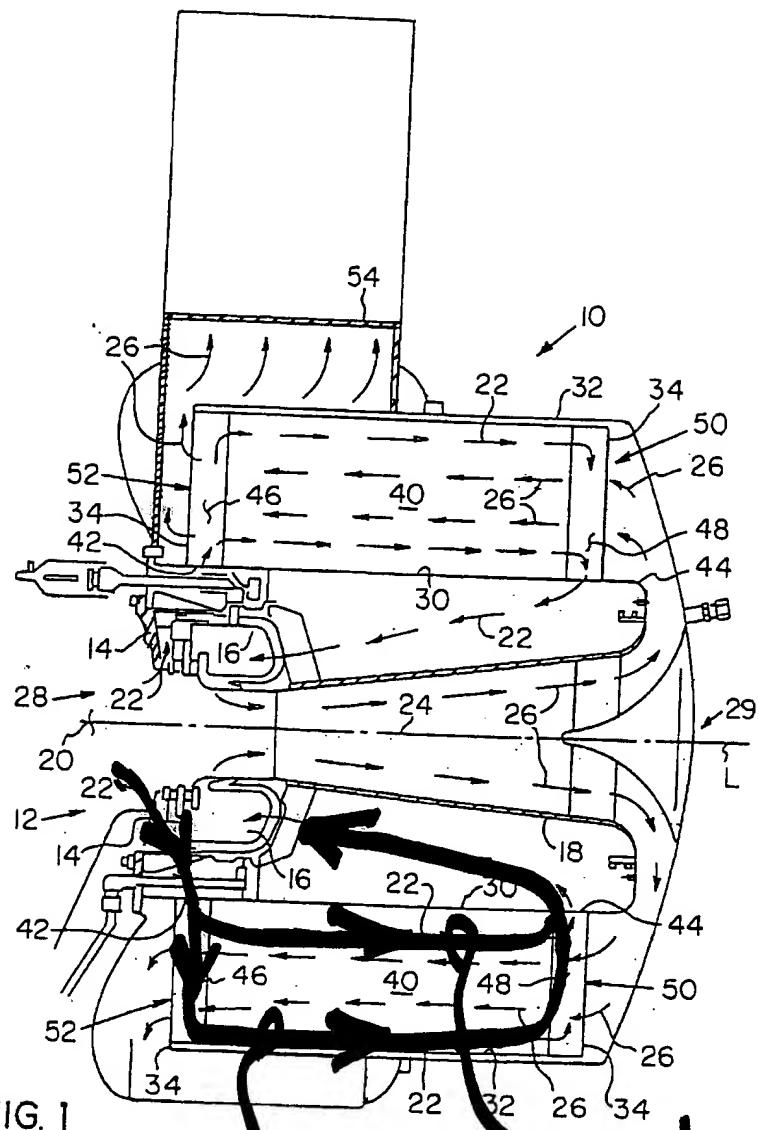


FIG. 1

*radially
outermost*

*radially
innermost*

Turning now to the language of the amended claims it will be seen that the subject matter of the amended claims is neither shown nor suggested by either the Nicita or Ryan references.

First, it is noted that the series of claims beginning with independent claim 23, which the Examiner has specifically addressed, included claims 31 and 33 which the Examiner indicated included allowable subject matter. Claim 23 has been amended to include the subject matter of claim 33, and thus it is believed that claim 23 and claims 24 and 26-31 depending therefrom are now in condition for allowance.

The merits of the remaining claims will be addressed with reference to both the Nicita and Ryan references cited by the Examiner.

The following discussion will focus by way of example on the language of independent claim 1 and the claims dependent therefrom. The arguments presented herein are equally applicable to independent claims 12 and 34 and the claims dependent therefrom.

Independent claim 1 requires that the recuperator have at least a first stage which includes “a first stage fluid inlet formed in the inner diameter” and a “first stage fluid outlet formed in the outer diameter”. This places the first stage fluid inlet 170 closely adjacent the compressor wheel 34 from which the cold compressed air originates, and places the first stage fluid outlet 172 on the outside diameter of the recuperator.

This arrangement is in stark contrast to either the embodiment of Figs. 1 or 6 of Nicita or the embodiment of Fig. 1 of Ryan.

In the embodiment of Fig. 1 of Nicita, the first stage 48 of each cold cell has its

fluid inlet on the outside diameter and its fluid outlet on the inside diameter.

In the embodiment of Fig. 6 of Nicita, the single stage of each cold cell has its inlet 49a on the outside diameter and its outlet 50a on the inside diameter. Thus both embodiments of Nicita have an arrangement opposite that required by the present invention so that Nicita places his first stage fluid inlet on the outside diameter of the heat exchanger. It would not be obvious to reverse this arrangement in Nicita because Nicita specifically teaches away from such a reversal in that he requires the compressed air to first flow axially through an annular outside chamber 52a for the express purpose of cooling the outer engine housing, which does not and cannot occur with the arrangement of the present invention. See col. 2 lines 43-49 of Nicita which reads as follows:

“One of the advantages of the engine configuration is that the compressor discharge air that is flowing in passage 15 flows along the inner wall of the outer engine shell and thus keeps the engine housing cool and also minimizes heat loss to improve overall engine efficiency.”

Thus Nicita does not show or suggest this fundamental arrangement of the first stage of the cold cell required by claim 1 so as to have the first stage fluid inlet on the inside diameter and the first stage fluid outlet on the outside diameter.

Turning now to U.S. Patent 6,438,936 to Ryan, Ryan has both his fluid inlet 42 and fluid outlet 44 on the inside diameter and thus is really of very little relevance to the teachings of claim 1.

Accordingly, it is respectfully submitted that claim 1 (and also independent

claims 12 and 34), and all claims dependent therefrom, are patentable over the cited references for the reasons indicated.

Additionally, certain ones of the dependent claims contain particularly significant features which are in no way shown or suggested by the cited references.

For example, claims 8 and 9 both require multi-stage arrangements wherein the second stage will have its second stage fluid inlet formed in the outside diameter and its second stage fluid outlet formed in the inside diameter. Again, the only multi-stage arrangement cited by the Examiner is that of Fig. 1 of Nicita which has its second stage 49 arranged exactly opposite that required by claim 8 or 9.

Also, it is noted that claims 10 and 11 are directed to features similar to those of claims 31 and 33 which the Examiner previously indicated as including allowable subject matter, and thus it is submitted that claims 10 and 11 are allowable for those additional reasons.

The same comments are applicable to the analogous dependent claims in the series depending from independent claims 12 and 34.

Accordingly, it is submitted that all of the dependent claims are allowable for these further reasons.

In The Specification

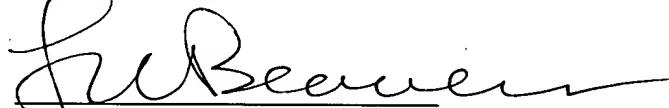
It is noted that the original specification in paragraph 0034 incorporated by reference a then-pending application and in fact the application included an entire copy of the referenced application as Exhibit A. Since that referenced application has now issued as U.S. Patent No. 6,487,096, it is not believed there is any need for the

unwieldy Exhibit A, and accordingly the same is being cancelled and simply replaced by a reference to the issued patent.

Conclusion

In summary, it is believed that the arguments and amendments set forth above are sound, and accordingly reconsideration of the application is requested along with an early indication of the allowance of claims 1-2, 4-22, 34-35 and 37-44 in addition to claims 23-24 and 26-31 which include subject matter previously indicated as allowable.

Respectfully submitted,

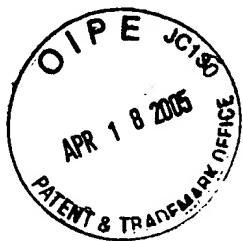


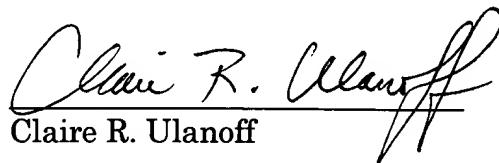
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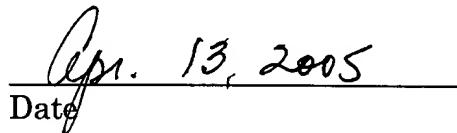
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I hereby certify that this Amendment is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on
4-13-05.




Claire R. Ulanoff


Date